GEOLOGICAL SURVEY OF CANADA

OPEN FILE 3791a

World distribution of nickel deposits

Compiled by:
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2000

Natural Resources Canada | Ressources naturelles Canada

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2000

World Distribution of Nickel Deposits

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- To install the database in Access immediately, skip to the section on Installation and Use of the Access™ Global Nickel Database system.
- The Access database and its data entry modules are for Access™ 7.0.
- Please note that if you intend to load the Access version of the database in any directory on your computer other than C:\NICKEL, ensure that you have installed the Linked Table Manager. Use these Add-In utilities to update pathnames as instructed.
- The data tables are all contained in the database named "nickel". However, if you wish to simplify the process of getting acquainted with database tables specifically associated with camps, deposits, production and resource figures, use the database data entry modules: nicamp, nidep, niprod, nires.
- If you wish to view spreadsheet-like queries of the data, use the "niquery" module. The queries in this module can be exported to common spreadsheet or database formats (e.g.: Excel™).
- If you wish to have the data entry menus appear automatically when opening the database modules (e.g. nidep), rename "Autoexec1" to "Autoexec" in the Macro View. It is better not to do this until the table links have been established properly.
- Refer to files Read_mdb.txt, Read_dbf.txt, and Read_shp.txt for additional information before installing.

Introduction

The database described herein is beta version 1.1 of a nickel database that was produced as part of the World Map Project cosponsored by the Geological Survey of Canada and industry. This database was originally released to the project sponsors in May, 1998. Improvements to the database, including revision of entity categories such as deposit type and mineralisation style, and expansion to include deposits of platinum group elements and chrome, are currently being undertaken as part of the GSC's World Minerals Geoscience Database Project.

The conceptual design and content of the database were defined by Roger Eckstrand (Geological Survey of Canada), and he has supervised its subsequent development. The structure of the digital database was defined interactively by David Good (contract) and Lesley Chorlton (contract), and data entry utilities were built by Sany Sam (student coop program). The data compilation and entry were performed by David Good. Subsequent refinement, testing, and preparation of this beta release were carried out by David Good, Lesley Chorlton, David Garson, and Robert Laramée (Geological Survey of Canada).

The nickel database contains basic geological information on economically significant international nickel deposits of both sulphidic and lateritic types. The purpose of this database is fourfold:

- to provide industry participants in this project with a revisable nickel database,
- to identify and locate world wide nickel resources,

- to indicate briefly their economic importance (mainly in terms of tonnage and grade) and geological character, and
- to be able to show distribution of nickel deposits on a Generalized Geological Map of the World.

Deposits of "economic significance" include former, current and planned producing mines; and other deposits that have been explored and not developed, but are nevertheless of economic interest. The database is intended to be used in conjunction with GIS software in order to portray the global distribution of nickel deposits. For example, GIS software has been used to show locations and types of nickel deposits on an accompanying map that highlights mafic and ultramafic magmatic suites, the rock units with which virtually all economic nickel deposits are associated.

The information contained in the database is of a basic level. It includes the following data (where available):

- Name of deposit, including alternate names
- Location, in terms of
  - -Country, state or province
  - -Latitude, Longitude
  - -UTM Zone, Easting, and Northing
- Status: past or current producer, undeveloped deposit (7 categories)
- Cumulative or Annual Production: Tonnage, grade (Ni, Cu, Co, Pt, Pd, Au), dates, date published
- Resources: tonnage, grades (Ni, Cu, Co, Pt, Pd, Au), date, date published
- Type of Deposit: 10-fold classification based on mineralogy of ores, nature of host rock, tectonic setting
- Mineralization Style: type of sulphide, laterite or sedimentary ore (20 categories)
- Host Rock: lithologic type and age
- Country Rock: lithologic type
- Tectonic Setting: 6-fold classification
- Geological Province: as locally defined in literature
- References: references for all data

Information on deposits is structured into two levels, representing two scales; deposit scale and camp scale. Normally the deposit scale is the logical scale for recording useful information. However addition of the camp scale has been necessitated in some cases because the only data available (mainly resource and/or production data) were composite for many of the deposits in one camp. Nevertheless, addition of the camp scale has the benefit of providing geological information for a broader context. Consequently a considerable number of deposits are treated on the camp scale as well, where circumstances and information permit.

Detailed information on the organization and structure of the database is presented in this document. Its Access™ tables and queries can be connected, through Open Database Connectivity (ODBC) utilities, to desktop GIS software, such as ArcView™3.0 and up and

MapInfo™4.5 and up, to display world nickel deposit and camp distribution classified by using field values.

Acknowledgments

Construction of this database of global nickel deposits by the Geological Survey of Canada has been made possible by the financial sponsorship of the following industrial partners:

Anglo American Corporation
Barrick Gold Corporation
BHP Minerals Canada Ltd.
Cyprus Amax Minerals Company
Falconbridge Limited
INCO Limited
Noranda Exploration Company Ltd.
Placer Dome Canada Ltd.
Rio Tinto Mining and Exploration Ltd.
WMC International Ltd.

In addition, Bob Stewart of Falconbridge Ltd. and Dick Alcock and Ed Pattison of INCO Ltd. provided seed lists of the names of world nickel deposits that served as a highly useful starting point for the compilation.

Sany Sam developed data entry utilities that greatly facilitated the entry of compiled data into the database.

Database Structure

Overview

The global nickel deposits database comprises six smaller relational databases built around the following entities: nickel deposits, nickel camps, production figures, resource estimates, nickel mines, and references (Figure 1). In each database, data are assigned a primary key (deposit number, reference number, etc.). The six databases are linked to one another using their primary keys. For example, the Bucko nickel deposit, deposit number 515, is linked to reference numbers 318, 328 and 364, camp number 42 (Thompson belt) and resource number 193.

The database is fully normalized. That is, objects are broken down as far as possible in the database; characteristics with modifiers are listed in two fields (e.g., a host age of late Jurassic is subdivided into two columns or fields in the table). Fields with more than one object are entered as separate records (e.g., commodities such as Ni, Cu, Co etc. are each recorded in a separate row or record in the table). The normalization, which may appear awkward to the uninitiated user, will allow flexible formatting of reports and facilitate query construction. For example, in a report, the authors of source material can be listed using either last name first and then initials, or initials first and then last name, or perhaps in any sequence of title, date and author. Queries such as: (a) "retrieve all of the deposits for which both nickel and platinum-group elements are considered important commodities"; (b) "retrieve all of the resource estimates for which a person with the last name of Adam and the initials J. D. is at least partially responsible", will be easy to build using query wizards supplied with Access™ or with SQL language.

The relationship of one data table to another is either one-to-many or many-to-many. If the relationship is one-to-many, the linkage is built by including the key of the data table for the one entry in the primary table of the data table with many entries. For example, one reference source is linked to many resource estimates by including the reference number in the primary resource table (resmain) each time it refers to a resource estimate. Many-to-many relationships between data tables are recorded in separate tables, commonly referred to as intersection tables or junction tables, with records containing the matching keys and any extra information needed to describe specific relationships. The camp and deposit data tables are linked using junction tables, as are the deposit and mine, deposit and production/resource, mine and production/resource, camp and production/resource, camp and reference, and deposit and reference. These inter-data table linkages are shown in Figure 1.

New categories of data, such as radiometric age dates or geochemistry, can be linked as one-to-many tables in the future. Alternatively, records of an independently maintained radiometric or geochemical database could be linked to deposits or camps using junction tables. This capability will make the mineral deposit database expandable and flexible.

Additional tables describe the content of the database in detail; these are referred to as the data dictionary (Figure 2). For this database, the data dictionary tables have been prepared as regular tables, largely redundant to the documentation facilities built into Access™. These

documentation tables start with a catalogue of all of the tables in the database which describes the function of each table, its subsidiary database (e.g. references, production numbers) and its primary key. Other documentation tables describe the fields in each data table and their meaning, and allowed values for all non-numerical fields in the data tables. This allows us, the preparers of these beta data sets, to export the documentation from Access™ to dbf files, along with the data tables.

Organization of Access™ Global Nickel Deposits database files

The Access™ version of the Global Nickel Deposits database is contained within one file or database shell, nickel.mdb. It is made up of six independent collections of tables built around deposit, mine, camp, resource, production, and reference entities, interlinked as described above. These tables are described in Appendix 1. Details about the columns (fields) contained in these tables, such as data type, format and description can be found in digital form as embedded in the Access database, in table form in nimeta.mdb, and in the meta directory of the dbf files.

Data in the Global Nickel Deposits database tables is entered or edited using four data entry utilities: nidep.mdb, nicamp.mdb, niprod.mdb, and nires.mdb included on Access™ disks 1 and 2 with the nickel.mdb database. Queries of the Global Nickel Deposits database should be made using the Niquery shell or module in order not to accidentally delete or rename queries used in constructing the database entry utilities.

These four shells, plus two query shells, are described as follows:

(a) Nickel.mdb contains all of the database tables.

(b) Nidep.mdb allows deposit, mine, and reference data to be entered and linked or unlinked. It also allows camps to be linked and unlinked by name.

(c) Nicamp.mdb allows camp and reference data to be entered and linked or unlinked. It also allows deposits to be linked and unlinked by name.

(d) Niprod.mdb allows production data and references to be entered and linked or unlinked. It also allows deposits, camps, and mines to be linked and unlinked by name.

(e) Nires.mdb allows resource estimates and references to be entered and linked or unlinked. It also allows deposits, camps, and mines to be linked and unlinked by name.

(f) Niquery.mdb contains queries of the entire nickel database. The queries mainly focus on summarizing categorical data into flat files and reports, and on listing resource and production data for deposits, camps and mines. This module also contains queries that roll up the references and filter them for deposits, camps, production figures, and resource figures, formatting them in one of many possible reference publication styles. A data entry module for references is desirable, but because references could be entered (and optionally not linked) using the other modules and because of a time and resource shortage, this was not done for this version of the nickel database.

(g) Nimeta.mdb contains two standalone data dictionary tables: **Columns**, describing columns or fields in each table, and **Tables**, cataloguing and describing the tables. The remaining tables in this module have been linked into nimeta from the nickel database. They are pick list tables, which describe values and their descriptions. Links can be viewed in the relationship windows

of the four data entry modules (recommended over the main nickel database for viewing relationships to reduce visual complexity).

The main form for each shell is distinguished by the suffix "main": Depgeol_Main, Campgeol_Main, ResMain, and ProdMain. Other forms listed in the **form view** are all dependent on the respective main form.

The data entry shells contain all of their tables as attached tables, as indicated by the little arrows before table names in the **table view**, except one or two temporary tables used by the application,.

The deposit database component

Deposit information is entered using the Nidep shell. The deposit database was considered the priority database for nickel. The main deposit table, depgeol, contains all elements of the deposit description for which there is only one characteristic per deposit, as follows: deposit classification as determined by the authors, deposit host age, ore age, tectonic setting, and location in geographical coordinates (latitude, longitude). Because a deposit may span country and/or state boundaries, political locations are stored in a separate table. Because one deposit may have several host rocks, several regional country rocks, several commodities, and several mineralization styles, each of these descriptive attributes is stored in a separate table linked in one-to-many relationship to depgeol using the deposit number (Figure 3).

Links to production figures or resource figures, and to camps, can be obtained through the ProDep, ResDep, and depcamp tables (Figures 5, 6). Links to mines are recorded in the depmine table (Figure 3).

The mine database component

Mine information is entered using the Nidep shell. Mine information is fairly simple and confined to the mine table. Mine records refer to individual mine names, owners, and operators for specific time duration. Each mine can be linked to a deposit through the depmine junction table (Figure 3). Links to production figures or to resource figures, even if partial, can be obtained through the ProdMine (Figure 5) or ResMine (Figure 6) tables, respectively.

The camp database component

Camp information is entered using the Nicamp shell. Because the camp information is approximately a composite of information on several deposits, the camp database content and structure is similar to that of the deposit database. The main table of the camp database, campgeol, contains all elements of the camp description for which there is only one characteristic per camp, as follows: camp classification as determined by the authors, camp host age, ore age, tectonic setting, and location in geographical coordinates (latitude, longitude). Because a camp may span country and/or state boundaries, political locations are stored in a separate table. Because one camp may have several host rocks, several regional country rocks, and several main

commodities, each of these descriptive attributes is contained in its own separate table linked in one-to-many relationship to campgeol using the camp number (Figure 4).

Links to production figures or to resource figures, even if partial, can be obtained through the ProdCamp (Figure 5) or ResCamp (Figure 6) tables, respectively. Each camp may be linked to one or more deposits through the depcamp table (Figure 4).

The production database component

Camp or deposit production data is entered using the Niprod shell. The main table, prodmain, contains all elements of the production description for which there is only one characteristic per production report, as follows: number of tonnes, start and end dates of reporting period, and the reference from which the data was extracted. Because one production figure may contain several commodities and associated grades, ore grades are stored in a separate table (prodgrad) linked in one-to-many relationship to prodmain using the production number (Figure 5).

Each production report may be linked to one or more deposits through the ProDep table, one or more camps through the ProdCamp table, and one or more mines through the ProdMine table (Figure 5). Any combination of mine, deposit, and camp can be linked and subsequently weighted using a newly added field, the PROPORTION field. The proportion field captures the percentage of each production figure assigned to each entity, which the data sources for many of these figures occasionally lump. The idea is to prevent the total production quantity from being added more than once into cumulative figures filtered for such attributes as deposit type or host type. The proportion has here been added arbitrarily, but users may change the proportions based on their own inside knowledge. The WHO field captures the initials of the data enterer for this field.

The resource database component

Camp, deposit, and mine resource data is entered using the Nires shell. The main table, resmain, contains all elements of the resource description for which there is only one characteristic per resource estimate (Figure 6), as follows: number of tonnes, the date of estimate, and the reference from which the data was extracted. It also includes a tag, named 'RESINRES', indicating whether a record in the table refers to an anomalous body of mineralization (subresource) that is physically included within a larger body recorded from the same data source in the database. This information necessitates entry of the subresource number and the main resource number in a recursive junction table, resinres. A separate tag, named 'RESADDED2', indicates that the resource figure accompanies another resource record for the same entity/ies at the same time as recorded from the same source. This information suggests the entry of the two resource numbers in the resadded2 junction table.

Because one resource figure may contain several commodities and associated grades, ore grades are stored in a separate table (resgrade) linked in one-to-many relationship to resmain using the production number (Figure 6). If it is an economic resource figure that is being reported, the cutoff grade is reported in the cutoff grade table, rescut, which is structured identically to the

grade table. Both may have a many-to-one relationship with the main resource estimate table (Figure 6).

Each resource report may be linked to one or more deposits through the ResDep table, to one or more camps through the ResCamp table, and to one or more mines through the ResMine table (Figure 6). Any combination of mines, deposits, and camps can be linked, and subsequently weighted using a new field, the PROPORTION field. The proportion field captures the percentage of each resource figure assigned to each entity, which data sources occasionally lump. The idea is to prevent the total resource quantity from being more than once added into cumulative figures filtered for such attributes as deposit type or host type. The proportion has here been added arbitrarily, but users may change the proportions based on their own inside knowledge. The new WHO field stores the initials of the person changing or adding this value.

The reference database component

Reference information can be entered using the Nidep, Nicamp, Nires or Nidep shells. The reference database contains a main reference table containing the title, date, and data source type. It is linked in one-to-many relationship with a table of authors. It is also linked in one to zero or one relationship to tables appropriate for each data source, as follows: journal article in papsrc, map in mapsrc, digital file in filsrc, newspaper article in newsrc, a book or volume in volsrc, and symposium article in symsrc (Figure 7). Symposium articles will be linked recursively to a symposium volume already entered in the main reference table.

References are linked to mines, and to production and resource figures directly through reference keys inserted in their primary tables (one-to-many relationship). References are linked to deposits and camps through junction tables, depref and campref (many-to-many relationship) (Figure 7). The categories of information extracted for each data source is captured in the extended junction tables, deprefx and camprefx, which contain a series of yes/no fields, one for each possible information category, plus start and end page numbers. Because the database custodian might wish to record page ranges for each category of information, particularly for sources of large size, the extended junction tables have a many-to-one relationship with the main junction table (Figure 7).

Queries

Warning: Do not delete any queries in the **query view** of Nidep, Nires, Nicamp or Niprod as all are used by the data entry forms.

We have tested the database and its ability to handle production and resource figures by building queries and reports unrelated to those used for the data entry shells. These queries are housed in **niquery.mdb** and are catalogued in Appendix 2 below.

Tips for loading the data entry and editing shells

There are two main considerations when loading the database into Access™:
1) The version of Access™ available to the user. It must be version 7.0 or higher.
2) The location for storing all of the database files (pathway).

Updating pathways

Copy the files Nipart1.exe and Nipart2.exe into the directory of your choice, and unpack them by clicking in Windows Explorer. If you chose to unpack them into a directory on the C drive named \nickel, you can omit the following steps.

Start Access™ and then open nidep, the nickel deposit data entry module. Before opening the main form (Depgeol_main) you will need to update, or refresh, the pathway to the database tables found in Nickel.mdb.

To refresh pathways in Access™7.0, click on Tools in the top menu banner, then click on the item: Add-ins, and then on: Linked table manager. Click first on the Select All button in the list on the right hand side of the new menu. Checks should appear in all of the check boxes for the file list in the menu's window. Then press OK. A file directory window should pop up. Navigate this window to the directory in which the nickel.mdb file is located and double click on nickel.mdb. All of the links will be refreshed automatically. In some cases, you might have to refresh each link separately.

Access has now refreshed all of the pathways connecting Nidep to the tables in the database (Nickel.mdb). You will have to repeat the above steps for Nicamp, Niprod, Nires, and Niquery.

Starting data entry/edit forms

To start up the data entry form for deposit and mines, open Nidep then click on depgeol_main, in the **forms view**. Because there are many forms in the **forms view**, all of which are dependent on the main form, we have included a macro in the **macro view** named **startentry**, which can be clicked to start a form for the data editing, adding, or deletion process.

Similarly, to open Nicamp, Niprod or Nires, click on campgeol_main, prodmain, or resmain, respectively in the **forms view**.

If you would like to open the data entry/edit form every time that you enter the nidep, nicamp, niprod, or nires database shells, go into the **macro view**, and rename autoexec1 to the name autoexec. Please first be sure that your links have been refreshed correctly.

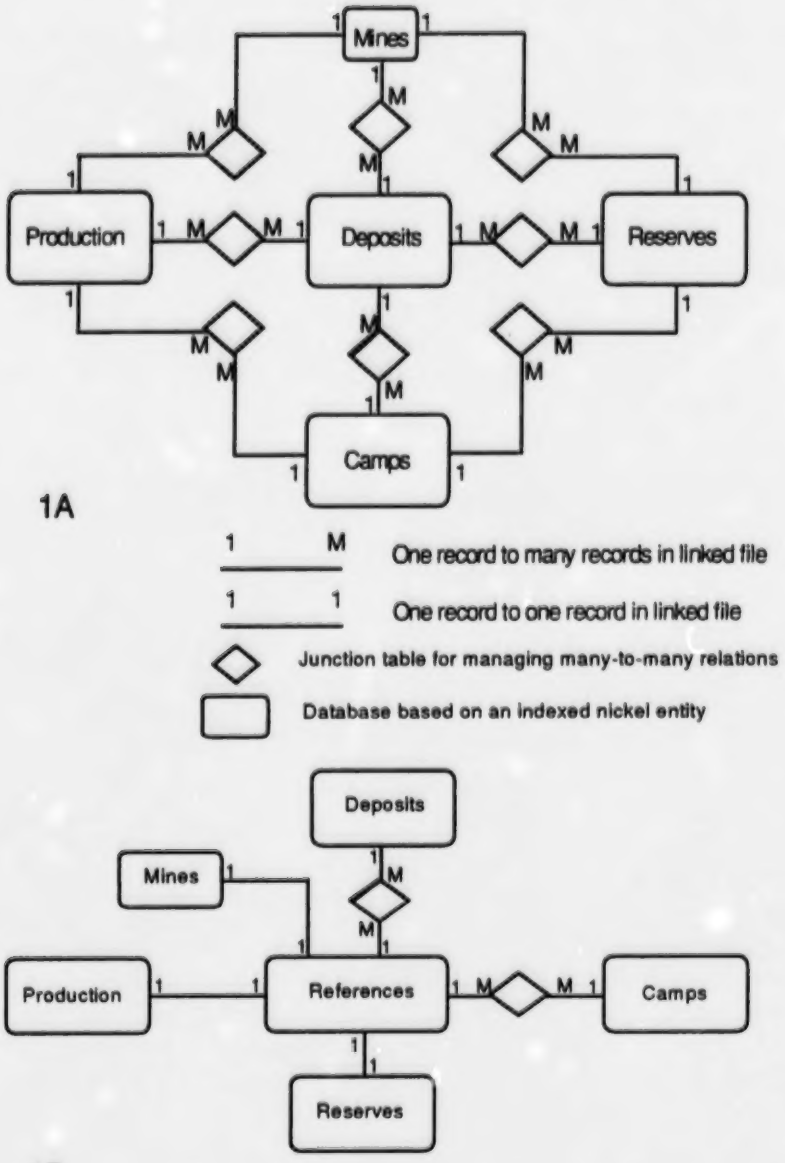

Figure 1: Organization and inter-relationships of the nickel (sub)-databases (1A); and the relationships of these databases with their data sources (1B). Note that the reserves label in this diagram should read resources.

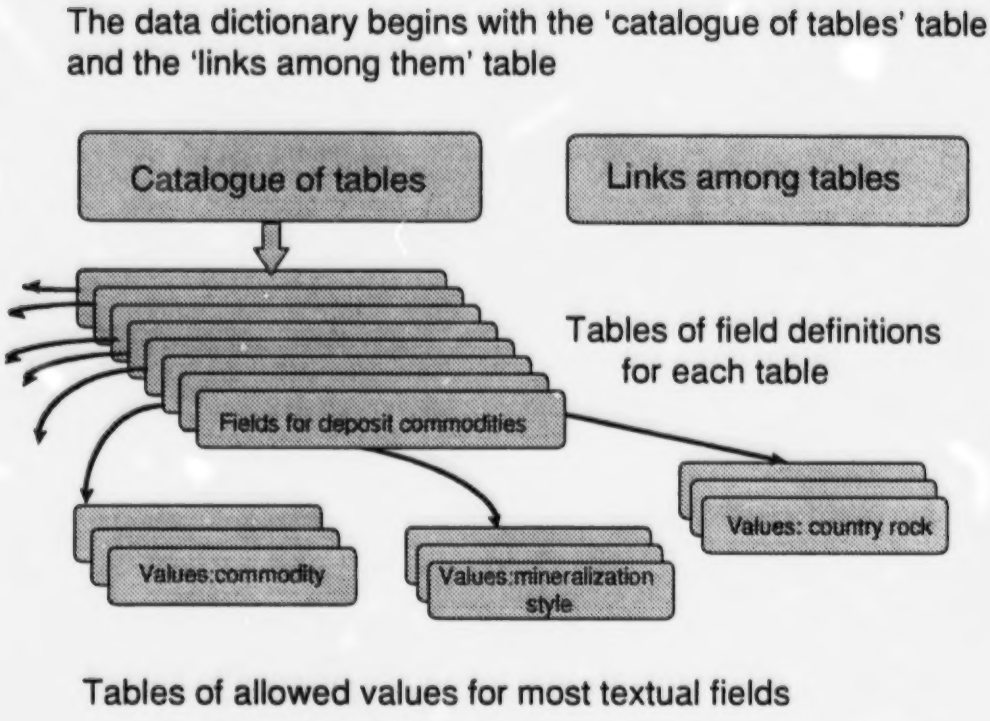

Figure 2: Idealized data dictionary for the nickel database. Nimeta.mdb contains the catalogue of tables in the form of the table: Tables, and the Fields for ... column/field descriptions in the form of the table: Columns. These were explicitly built in Access for export to dbf files for importing into other GIS and database software. Value tables for individual fields have been linked into nimeta from nickel.mdb. The table-table links table has not yet been prepared.

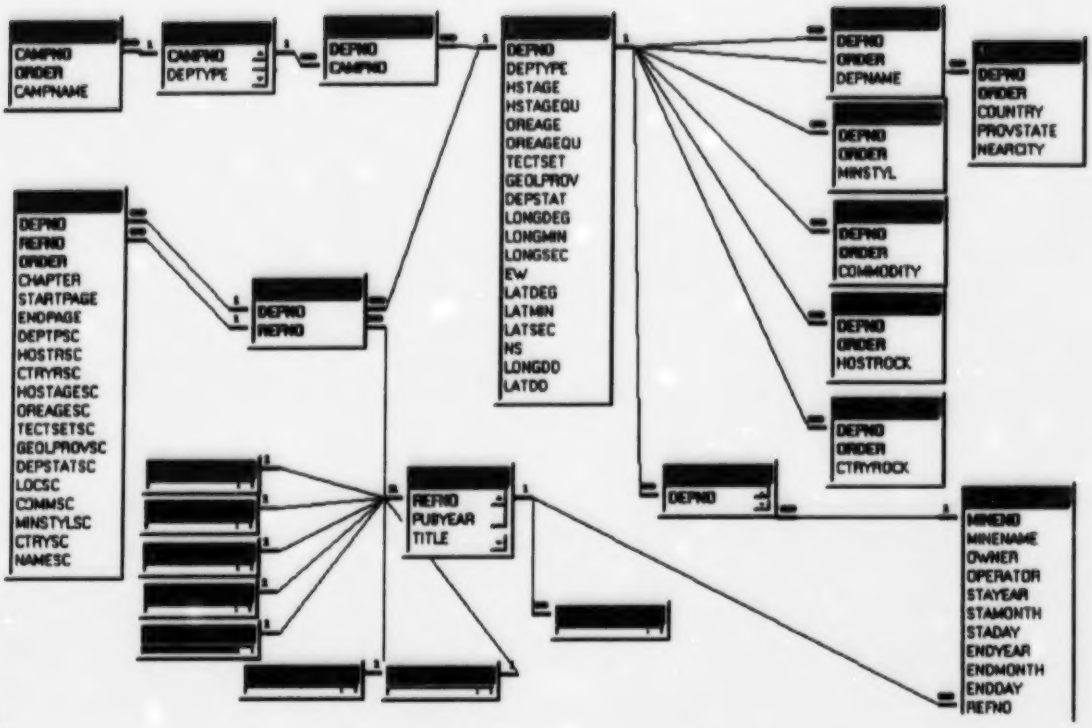

Figure 3: The structure of the nickel deposit database.

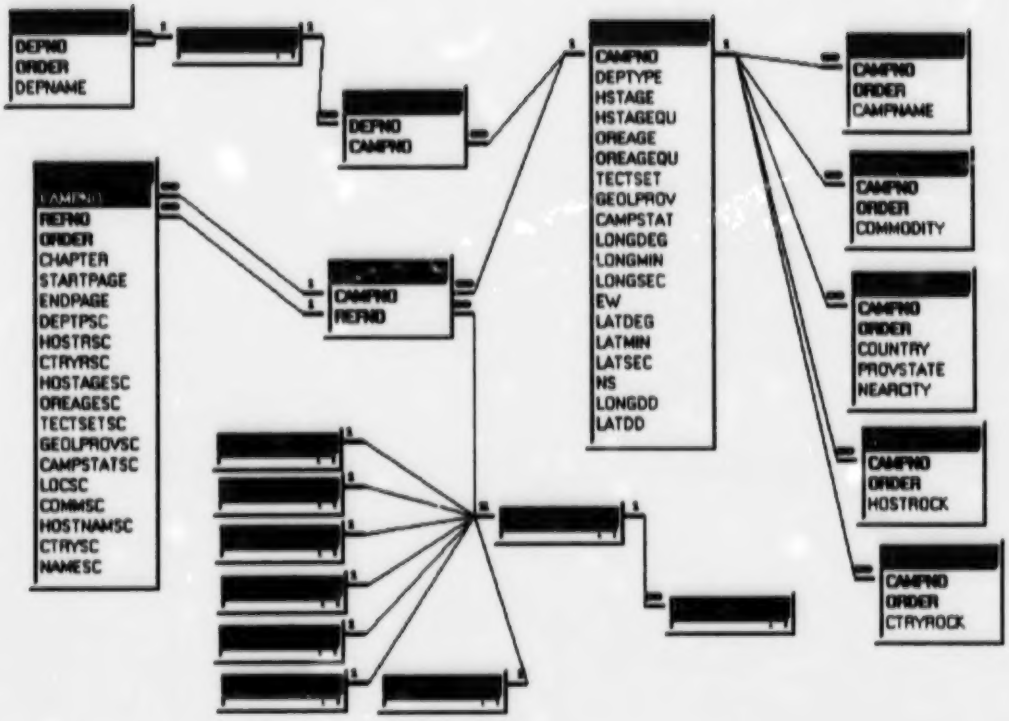

Figure 4: The structure of the nickel camp database.

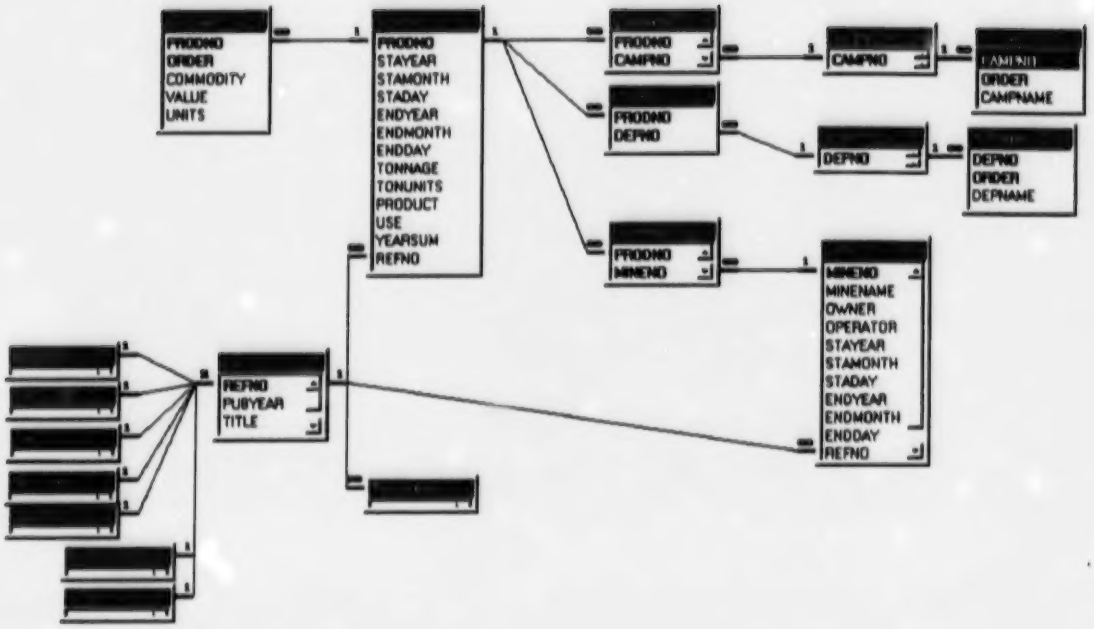

Figure 5: The structure of the nickel production figure database.

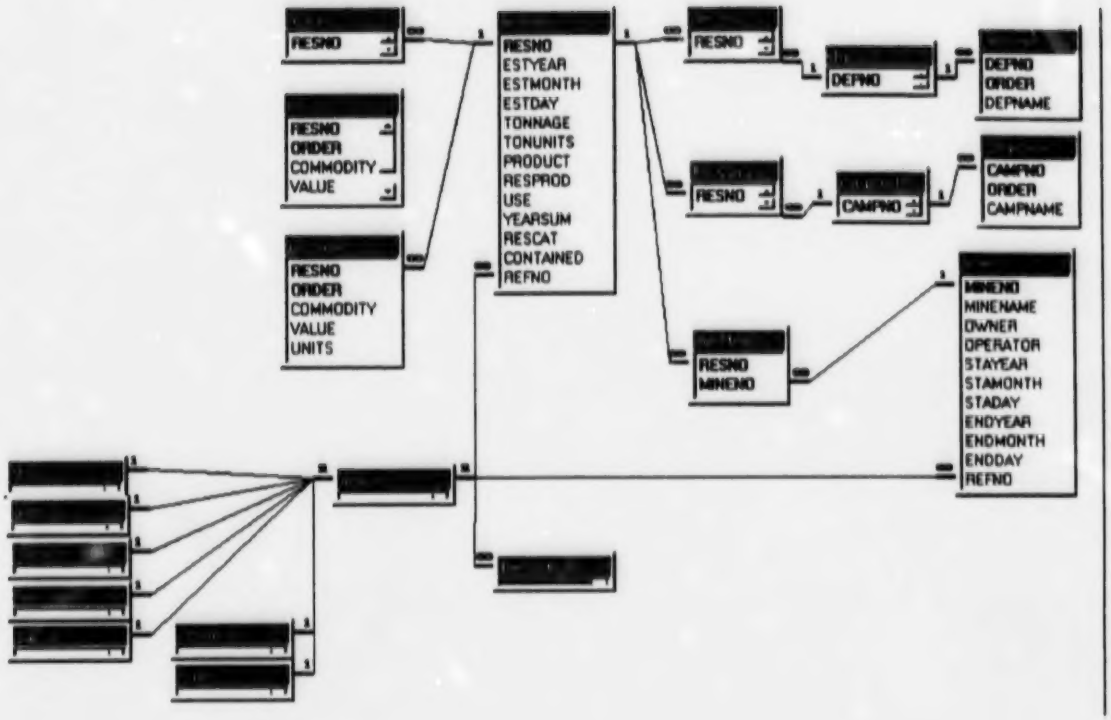

Figure 6: The structure of the resource estimate database.

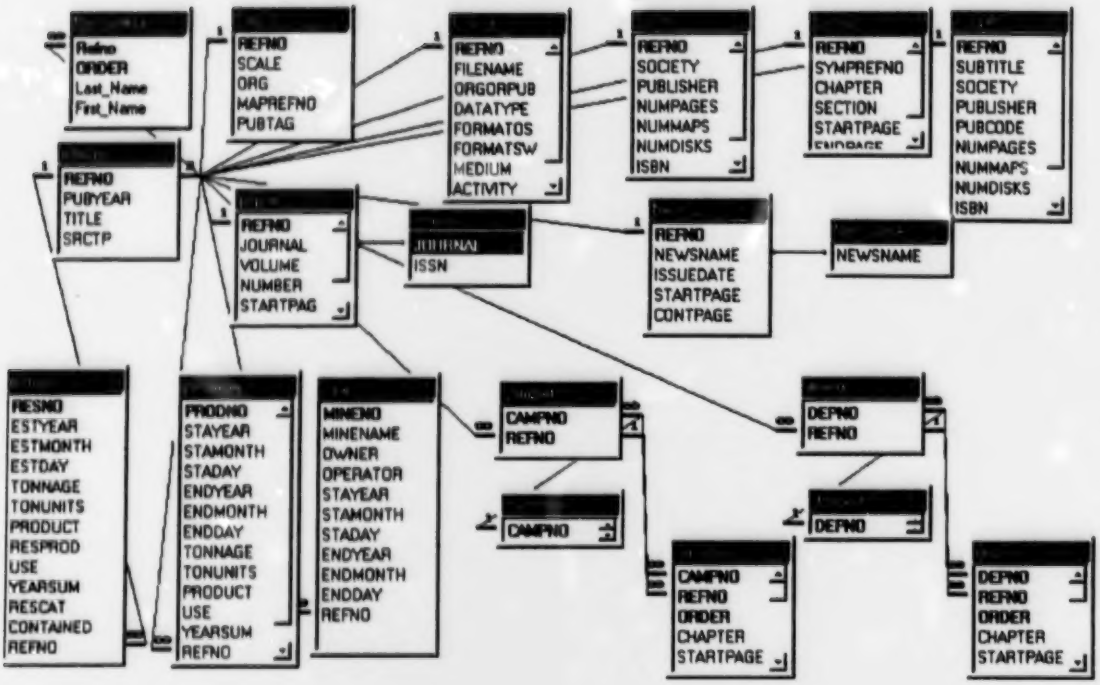

Figure 7: The structure of the reference database.

Appendix 1: Tables in Global Nickel Deposits Database File (nickel.mdb)

Table name	Table Type	Table theme or function	Pertains to?	# rows
campage	Data table	time stratigraphic age and confidence	camp entity	0
campagem	Data table	radiometric age and confidence	camp entity	0
CampCom	Data table	commodities in order of importance	camp entity	95
campctry	Data table	country, province and nearest city	camp entity	36
campgeol	Data table	general geology and location	camp entity	37
campname	Data table	names	camp entity	38
camprefx	Data table	describes relationship between camp and references	camp and reference entities	95
cpctryrx	Data table	country rocks in order of importance	camp entity	34
cphostrx	Data table	host rocks in order of importance	camp entity	40
ctryrock	Data table	country rocks in order of importance	deposit entity	442
depagema	Data table	radiometric age and confidence	deposit entity	0
DepCom	Data table	commodities in order of importance	deposit entity	1229
DepCtry	Data table	country, province and nearest city	deposit entity	559
depgeol	Data table	general geology and location	deposit entity	559
depname	Data table	names	deposit entity	652
deprefx	Data table	describes relationship between deposit and references	deposit and reference entities	1623
dphostrx	Data table	host rocks in order of importance	deposit entity	518
filsrc	Data table	details particular to a digital data reference	reference entity	7
HostName	Data table	host rock names in order of significance	camp entity	33
mapsrc	Data table	details particular to a map reference	reference entity	9
mine	Data table	mine information	mine entity	47
Minstyle	Data table	mineralization style in order of importance	deposit entity	783
Newsrc	Data table	details particular to a periodical or news journal reference	reference entity	35
papsrc	Data table	details particular to a journal article reference	reference entity	124
prodgrad	Data table	commodities and grades in order of importance	production entity	138
prodmain	Data table	production tonnage figures and dates	production entity	105
Ref_Author	Data table	authors in cited order	reference entity	854
refmain	Data table	main reference information such as title	reference entity	411
repsrc	Datat table	details particular to a report reference	reference entity	1
rescut	Data table	cutoff grades for resource figures in order of importance	resource entity	12
resgrade	Data table	commodities and grades in order of importance	resource entity	403
resmain	Data table	resource tonnage figures and dates	resource entity	216
svolsrc	Data table	details particular to a symposium volume reference	reference entity	35
symsrc	Data table	details particular to a symposium article reference	reference entity	178
volsrc	Data table	details particular to a book or volume reference	reference entity	23
campref	Junction table	records many-to-many relationships	camp and reference entities	193
depcamp	Junction table	records many-to-many relationships	deposit and camp entities	246

depmine	Junction table	records many-to-many relationships	deposit and mine entities	45
depref	Junction table	records many-to-many relationships	deposit and reference entities	1695
ProdCamp	Junction table	records many-to-many relationships	camp and production entity	8
ProDep	Junction table	records many-to-many relationships	deposit and production entities	108
ProdMine	Junction table	records many-to-many relationships	mine and production entities	0
ResCamp	Junction table	records many-to-many relationships	camp and resource entities	21
ResDep	Junction table	records many-to-many relationships	deposit and resource entity	211
resinres	Junction table	records one-to-one relationships	resource and resource entities (for anomalous zones within a broader resource estimate)	24
Resadded2	Junction table	Records one-to-one relationships	Resource and resource entities (for non-overlapping estimates for the same group of entities at the same time by the same sources)	0
ResMine	Junction table	records many-to-many relationships	mine and resource entities	6
agetsma	Value list	time stratigraphic ages	deposit and camp entities	79
DepStat	Value list	exploration and/or exploitation status	deposit entity	7
DepType	Value list	deposit class and description	deposit and camp entity	10
Journal	Value list	journal names and ISSN	reference entity	49
Minstyl	Value list	mineralization style and description	deposit entity	21
Newsname	Value list	periodical or newspaper names	reference entity	1
Product	Value list	production material reported	production entity	3
Rescat	Value list	resource categories	resource entity	3
TectSet	Value list	tectonic setting and description	deposit and camp entities	5
Tonunits	Value list	tonnage units	production and resource entities	6
Units	Value list	grade units	production and resource entities	4
Yearsum	Value list	periodic or cumulative production value	production entity	2
Commodity	Value list	commodity abbreviations	camp, deposit, production, and resource entities	17
xCtryRok	Value list:	country rock terms and descriptions	camp and deposit entities	21
xHostRok	Value list:	host rock terms and descriptions	camp and deposit entities	25
xWho	Value list	data entry person for proportion fields in ProDep, ProdCamp, ProdMine, ResCamp, ResDep, and ResMine	production and resource entities in their relationships to camp, deposit, and mine entities	2

Appendix 2: Sample queries set up in **niquery.mdb**. The numbered queries below are the final, formal queries. The unnumbered queries that follow them in the query view are utility queries that are used by the numbered queries, and should not be deleted.

1_References_fullcitation	References with authors concatenated with their last names first, for all nickel entities
2_Deposit4GIS	Deposit summary for use with desktop GIS software
3_Camp4GIS	Camp summary for use with desktop GIS software
4_MetalsProduced4Camps	Estimated production for tonnes metal listed by deposit and time period.
5_MetalsProduced4Deposits	Estimated production for tonnes metal listed by deposit and time period.
6_MetalResources4Camps	Estimated resources in tonnes metal listed by camp and date of estimate.
7_MetaResources4Deposits	Estimated resources in tonnes metal listed by deposit and date of estimate.
8a_DeptypebyAge	Crosstab query summarizing the total numbers of deposits of each type subdivided by host age at the era level.
8b_DeptypebyCountry	Crosstab query summarizing the total numbers of deposits of each type subdivided by country.
8c_ DeptypebyHostrock	Crosstab query summarizing the total numbers of deposits of each type subdivided by host rock.
8d_DeptypebyMinstyle	Crosstab query summarizing the total numbers of deposits of each type subdivided by mineralization style.
8e_DeptypebyTectSet	Crosstab query summarizing the total numbers of deposits of each type subdivided by tectonic setting.
9a_TotalbyDepositType	The number of deposits in each deposit type, arranged in descending order.
9b_TotalbyHostRock	The number of deposits in each host rock, arranged in descending order.
9c_TotalbyMinstyle	The number of deposits with each mineralization style, arranged in descending order.
9d_TotalbyCountry	The total number of deposits occurring in each country, arranged in descending order.

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